JS 2/23/22
RJA 2/24/22

INITIAL REVIEW ENGINEERING REPORT [redacted]
PMN: 18-0324

Focus Ready Draft 11/5/2018
ENGINEER: Macek \ JAS
PV (kg/yr): [redacted] Import Only NX

SUBMITTER: [redacted]

USE: Resin/binder in paint formulations for industrial and architectural applications.
Si-OMe [redacted].

OTHER USES: [redacted]

MSDS: Yes Label: No

Gen Eqpt: Chemical resistant gloves / Safety glasses with side shields / Long sleeves Safety shoes / General (mechanical) room ventilation is expected to be satisfactory if handled at low temperatures or in covered equipment.

Respirator: If ventilation is insufficient, suitable respiratory protection must be provided. Respirator with a vapour filter (EN 141) If exposure limits are exceeded or respiratory irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Supplied air respirators may be required for non-routine or emergency situations. Respiratory protection must be provided in accordance with OSHA regulations (see 29CFR 1910.134).

Health Effects: [redacted]

CRSS (10/09/2018):

Chemical Name: [redacted]

S H2O: Reacts g/L @

VP: 1.0E-6 torr @

MW: [redacted] [redacted]%<500 [redacted]%<1000

Physical State and Misc CRSS Info:

Neat: Solid (est.) Mfg: Imported as Solution: 80% PMN material in a mixture of solvent naphtha (petroleum), light aromatic and butyl acetate Proc/Form: Solution: 50% PMN material in paint formulation End Use: Destroyed. Submitted data: NAVG MW = [redacted] by GPC with [redacted]% less than 500 and [redacted]% less than 1000; additionally, [redacted]% of the PMN material consists of large polymeric components with a NAVG MW of [redacted] while [redacted]% consists of the [redacted] MW oligomer on the [redacted] and [redacted]% consists of the [redacted] MW oligomer on [redacted] The submitted MSDS and physico-chemical properties are for PMN material in formulation.

Estimated data: high boiling point and negligible water solubility (high MW polymer); reacts with water (Si-OMe).

Si-OMe [redacted] Hydrolysis may be inhibited by low water solubility.

SMILES [redacted]

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SMILES for the [redacted]

Consumer Use: No

SAT (concerns) :

Related Cases and Misc SAT Info:

Analogues: [redacted]

Migration to groundwater: ;1 PMN;Hyd Pdt

PBT rating: P0B0T0

Health: Other

Eco: 1 No releases to water, XB Testing

OCCUPATIONAL EXPOSURE RATING: [redacted]

NOTES & KEY ASSUMPTIONS:
Occupational exposure and environmental releases were estimated using the 9/30/2013 version of ChemSTEER tool. Input to ChemSTEER tool includes information from: the PMN submission, physical / chemical properties, and relevant past cases. PMN is import only; therefore PROC and USE assessed. // No same submitter, similar use past cases were found. The following similar use past cases were referenced for consistency: [redacted] assesed using the Formulation of Waterborne Coatings GS (not consistent with this IRER - this PMN hydrolyzes with water). This IRER asseses container and equipment cleaning (generally consistent with past cases). All past cases assessed dermal exposure only. // Use: Releases were assessed for conatiner cleaning, equipment cleaning, and coating application (consistent with all past cases). Dermal exposure was assessed from unloading (consistent with all past cases, where required per SAT). Inhalation exposure was assessed during coating application (consistent with all past cases).

POLLUTION PREVENTION CONSIDERATIONS:
P2 Claim: 2-Component polyurethane (2K PU) technologies are a popular choice for protective coatings applications as they are capable of delivering outstanding mechanical, physical, and chemical properties that remain durable in harsh and challenging environments, where other coating technologies would fail. However, they can pose significant environmental and human health concerns due to the presence of isocyanate, especially when spray applied. The NCS addresses the current need for substances that can provide properties comparable to those of current 2K PU systems while eliminating exposure risks associated with isocyanate containing chemicals.

EXPOSURE-BASED REVIEW: No

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Processing: Formulation of Coating

Number of Sites/ Location: 25

unknown site(s)

Days/yr: 13

Basis: Submission estimates 10-25 customer sites, 13 exposure days/site-yr. PMN arrives ~80% and is formulated down to 50% in coating. CS calcualtes 615.4 kg/site-day.

Process Description: PMN (liquid, 80%) imported in drums --> Unloaded into Day Tank --> Pumped to Mixing Tank with Fillers, Pigments, Plasticizers, Solvents --> Packaging (liquid, <50%) (per submission)

ENVIRONMENTAL RELEASES ESTIMATE SUMMARY

IRER Note: The daily releases listed for any source below may coincide with daily releases from the other sources to the same medium.

Water or Incineration or Landfill
High End: 1.8E+1 kg/site-day over 13 days/yr from 25 sites
or 2.4E+2 kg/site-yr from 25 sites or 6.0E+3 kg/yr-all sites
to: uncertain
from: Cleaning Liquid Residuals from Drums Used to Transport the Raw Material
basis: EPA/OPPT Drum Residual Model, CEB standard 3% residual. The submission estimates 15.3 kg/site-day released to POTW (approx 3% residual - consistent with standard model). The submission indicates that hydrolysis of the LVE occurs at the drum reclaimer facility. Hydrolysis occurs in minutes (LVE destroyed). Because of uncertainty at unknown customer sites, RAD asseses release to uncertain media.

Water or Incineration or Landfill
Conservative: 6.2E+0 kg/site-day over 13 days/yr from 25 sites
or 8.0E+1 kg/site-yr from 25 sites or 2.0E+3 kg/yr-all sites
to: uncertain
from: Equipment Cleaning Losses of Liquids from a Single, Large Vessel

basis: EPA/OPPT Single Vessel Residual Model, CEB standard 1% residual. The submission indicates that the metering equipment and the dispensing unit are usually not washed, but rather purged with the next product they want to run. Submission indicates that when production lines and mixing equipment washed with water and detergent hydrolyzes any residual LVE within minutes. Because of uncertainty at unknown customer sites, RAD asseses 1% residual daily release to uncertain media.

RELEASE TOTAL
8.0E+3 kg/yr - all sites

OCCUPATIONAL EXPOSURES ESTIMATE SUMMARY
Tot. # of workers exposed via assessed routes: 75
Basis: The submission estimates a total of 25 workers (1 worker/site). RAD assesses a minimum of 3 workers/site.

Inhalation:

negligible (VP < 0.001 torr). Generation of mists/aerosols/particulates not expected from blending operations.

Dermal:

Exposure to Liquid at 80.00% concentration
High End:
> Potential Dose Rate: 1.8E+3 mg/day over 13 days/yr
> Lifetime Average Daily Dose: 4.1E-1 mg/day over 13 days/yr
> Average Daily Dose: 8.0E-1 mg/day over 13 days/yr
> Acute Potential Dose: 2.2E+1 mg/day over 13 days/yr
Number of workers (all sites) with dermal exposure: 75
Basis: Unloading Liquid Raw Material from Drums; EPA/OPPT 2-Hand Dermal Contact with Liquids Model. Per November 2016 RAD guidance, default parameters for this model were updated: body weight (BW) was updated from 70 to 80 kg and Averaging Time over a Lifetime (ATc) was updated from 70 to 78 years.

INITIAL REVIEW ENGINEERING REPORT [redacted]

PMN: 18-0324

Use: Application of Industrial and Architectural Coatings

Number of Sites/ Location: 50

unknown site(s)

Days/yr: 100

Basis: Submission did not estimate number of use sites. submission estimated paint application rate of 80 kg/site-day and indicated 100 days of application per site-yr in PMN. CS calculates 50 use sites and daily amount of PMN chemical applied of 40 kg//site-day. .

Process Description: Coating (liquid, 50%) --> Application to surface by rolling, spraying, or brushing --> Drying (PMN destroyed) (per submission)

ENVIRONMENTAL RELEASES ESTIMATE SUMMARY

IRER Note: The daily releases listed for any source below may coincide with daily releases from the other sources to the same medium.

Water
Output 2: 3.1E+0 kg/site-day over 100 days/yr from 50 sites
or 3.1E+2 kg/site-yr from 50 sites or 1.5E+4 kg/yr-all sites
to: Air (4%), Water (9.6%), and Landfill (86.4%) (model)
from: Coating Using Hand-Held Spray Gun
basis: EPA/OPPT Automobile OEM Coating Overspray Loss Model (non-volatiles). Submisson does not esitmate releases. RAD assesses using a standard model to uncertain media.

Water or Incineration or Landfill
High End: 3.1E+0 kg/site-day over 38 days/yr from 50 sites
or 1.2E+2 kg/site-yr from 50 sites or 5.9E+3 kg/yr-all sites
to: uncertain
from: Cleaning Liquid Residuals from Drums Used to Transport the Raw Material
basis: EPA/OPPT Drum Residual Model, CEB standard 3% residual. The submission indicates that residual coating in containers will be moisture-cured due to ambient humidity. Because of uncertainty at unknown customer sites, RAD asseses release to uncertain media.

Water or Incineration or Landfill
Conservative: 8.0E-1 kg/site-day over 100 days/yr from 50 sites
or 8.0E+1 kg/site-yr from 50 sites or 4.0E+3 kg/yr-all sites
to: uncertain
from: Equipment Cleaning Losses of Liquids from Multiple Vessels
basis: EPA/OPPT Multiple Process Vessel Residual Model, CEB standard 2% residual. Submission did not discuss equipment cleaning. Because of uncertainty at unknown customer sites, RAD asseses release to uncertain media.

Air
Output 2: 1.3E+0 kg/site-day over 100 days/yr from 50 sites
or 1.3E+2 kg/site-yr from 50 sites or 6.4E+3 kg/yr-all sites
to: Air (4%), Water (9.6%), and Landfill (86.4%) (model)
from: Coating Using Hand-Held Spray Gun
basis: EPA/OPPT Automobile OEM Coating Overspray Loss Model (non-volatiles). Submisson does not esitmate releases. RAD assesses using a standard model to uncertain media.

Landfill
Output 2: 2.8E+1 kg/site-day over 100 days/yr from 50 sites
or 2.8E+3 kg/site-yr from 50 sites or 1.4E+5 kg/yr-all sites
to: Air (4%), Water (9.6%), and Landfill (86.4%) (model)
from: Coating Using Hand-Held Spray Gun

basis: EPA/OPPT Automobile OEM Coating Overspray Loss Model (non-volatiles). Submisson does not esitmate releases. RAD assesses using a standard model to uncertain media.

RELEASE TOTAL
1.7E+5 kg/yr - all sites

OCCUPATIONAL EXPOSURES ESTIMATE SUMMARY
Tot. # of workers exposed via assessed routes: 800
Basis: The submission estimates up to 16 workers/site.

Inhalation:

Exposure to Mist (non-volatile) (Class I)
Respirable Particulates:
> Potential Dose Rate: 4.4E+0 mg/day over 100 days/yr
> Lifetime Average Daily Dose: 7.6E-3 mg/kg-day over 100 days/yr
> Average Daily Dose: 1.5E-2 mg/day over 100 days/yr
> Acute Potential Dose: 5.6E-2 mg/day over 100 days/yr
Total Particulates:
> Potential Dose Rate: 1.5E+2 mg/day over 100 days/yr
> Lifetime Average Daily Dose: 2.6E-1 mg/kg-day over 100 days/yr
> Average Daily Dose: 5.3E-1 mg/day over 100 days/yr
> Acute Potential Dose: 1.9E+0 mg/day over 100 days/yr
Number of workers (all sites) with inhalation exposure: 800

Basis: Coating Using Hand-Held Spray Gun; User-defined Inhalation Model. Per November 2016 RAD guidance, the following default parameters for this model were updated: body weight (BW) was updated from 70 to 80 kg and Averaging Time over a Lifetime (ATc) was updated from 70 to 78 years. Because of a ChemSTEER bug, these numbers were reversed to allow for calculation (BW = 78 kg and ATc = 80 years). Concentration: Cm = 7.5 exposure duration: h = 8 hr/day. The submitter provided particulate size data for recommended spray nozzles. The study indicated that the amount of droplet sizes under 10 microns ranged from 0.2 to 2.9%. The concentrations of the other components of the coating are unknown at this time so no adjustment for the PMN chemicals concentration in the mist is made at this time. RAD asseses inhalation exposure to particulates as Cm = 15 mg/m3 x [redacted] = 0.435 mg/m3 (respirable) to 15 mg/m3 (total); h =8 hr/day.

NOTE: The respirator class is: I. Particulate (including solid or liquid droplets).

INHALATION MONITORING DATA REVIEW

1)	Uncertainty (estimate based on model, regulatory limit, or data not specific to industry):	Yes
2)a)	Exposure level > 1 mg/day?	Yes
	OR	
b)	Hazard Rating for health of 2 or greater?	No

=> Inhalation Monitoring Data Desired? **No**

Dermal:

Exposure to Liquid at [redacted] concentration

High End:

> Potential Dose Rate: 1.1E+3 mg/day over 100 days/yr

> Lifetime Average Daily Dose: 2.0E+0 mg/day over 100 days/yr

> Average Daily Dose: 3.8E+0 mg/day over 100 days/yr

> Acute Potential Dose: 1.4E+1 mg/day over 100 days/yr

Number of workers (all sites) with dermal exposure: 800

Basis: Unloading Liquid Raw Material from Drums; EPA/OPPT 2-Hand Dermal Contact with Liquids Model. Per November 2016 RAD guidance, default parameters for this model were updated: body weight (BW) was updated from 70 to 80 kg and Averaging Time over a Lifetime (ATc) was updated from 70 to 78 years.